LO-CW800-2LR4C

800G OSFP CWDM 2LR4 10KM SMF Dual Duplex LC Optical Transceiver

Features

- Compliant with MSA-2x400G-LR4-10 Optical Interface
- Compliant with IEEE P802.3ck D3.0-2x400GAUI-4 C2M Electrical Interface
- Compliant with OSFP MSA HW Rev 4.1-Type 2 Housing with Dual LC Connector
- Compliant with CMIS Rev 5.0
- Maximum Power Consumption 18W
- 8x106.25 Gb/s PAM4 Modulation
- Single 3.3V Power Supply
- Operating Case Temperature Range: 0 to +70°C
- Two Wire Serial Interface with Digital Diagnostic Monitoring
- Class 1 Laser Safety

Applications

- 800G Ethernet
- Data Center
- Breakout 2x 400G LR4

Description

The LO-CW800-2LR4C OSFP transceiver supports up to 10km link lengths over single-mode fiber (SMF) via dual LC connectors. This transceiver is compliant with IEEE 802.3ck, OSFP MSA and CMIS Rev 5.0 standards. The built-in digital diagnostics monitoring (DDM) allows access to real-time operating parameters. It is suitable for 800G Ethernet, Breakout 2x 400G LR4 and Data Center applications.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Storage Temperature Range	TS	-40		85	°C	
Supply Voltage	VCC	-0.5		3.6	V	
Relative Humidity (non-condensing)	RH	5		95	%	
Data Input Voltage Differential	|VDIP-VDIN|			1	V	
Control Input Voltage	VI	-0.3		VCC+0.5	V	
Control Output Current	IO	-20		20	mA	

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit
Operating Case Temperature	TOPR	0		70	°C
Power Supply Voltage	VCC	3.135	3.3	3.465	V
Maximum Power Dissipation	PD		16	18	W
Maximum Power Dissipation, Low Power Mode	PDLP			2	W
Signalling Speed per Lane	DRL		53.125		GBd
Control Input Voltage High	VIH	VCC*0.7		VCC+0.3	V
Control Input Voltage Low	VIL	-0.3		VCC*0.3	V
Two Wire Serial Interface Clock Rate				400	kHz

Power Supply Noise 1 kHz - 1 MHz (p-p)				66	mVpp
Operating Distance		2		2000	m

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Line wavelengths	λ0	1264.5	1271	1277.5	nm	
	λ1	1284.5	1291	1297.5	nm	
	λ2	1304.5	1311	1317.5	nm	
	λ3	1324.5	1331	1337.5	nm	
Transmitter(per Lane)						
Side-mode suppression ratio (SMSR)	SMSR	30			dB	
Total average launch power	AOPT			11.1	dBm	
Average Launch Power, each lane	AOPL	-2.7		5.1	dBm	1
Outer Optical Modulation Amplitude (OMAouter), each Lane for TDECQ <1.4 dB for 1.4 dB ≤TDECQ ≤3.4 dB	TOMA	-0.2 – 1.1 + TD3CQ		4.4	dBm	
Difference in launch power between any two lanes (OMAouter) (max)	AOPd			4	dB	
Transmitter and Dispersion Eye Closure for PAM4 (TDECQ), each lane	TDECQ			3.9	dB	
Transmitter Eye Closure for PAM4 (TECQ),each Lane	TECQ			3.9	dB	
| TDECQ – TECQ |				2.5	dB	
Transmitter Over/under-shoot				25	%	

Transmitter power excursion				5.2	dBm	
Average Launch Power of OFF Transmitter, each lane	TOFF			-16	dBm	
Extinction Ratio	ER	3.5			dB	
Transmitter transition time (max)	Tr			17	ps	
RIN 17.1OMA (max)	RIN			-136	dB/Hz	
Optical Return Loss Tolerance	ORL			15.6	dB	
Transmitter Reflectance	TR			-26	dB	2
Receiver(per Lane)						
Line wavelengths	λ4	1264.5	1271	1277.5	nm	
	λ5	1284.5	1291	1297.5	nm	
	λ6	1304.5	1311	1317.5	nm	
	λ7	1324.5	1331	1337.5	nm	
Damage Threshold, each Lane	AOPD	6.1			dBm	
Average Receive Power, each Lane	AOPR	-9		5.1	dBm	
Receive Power (OMAouter), each Lane	OMAR			4.4	dBm	
Difference in receive power between any two lanes (OMAouter) (max)	AOPg			4.3		
Receiver Reflectance	RR			-26	dB	
Receiver sensitivity (OMAouter), each lane for TECQ < 1.4 dB for 1.4 dB ≤ TECQ≤3.4 dB	SOMA			-6.8 – 8.2 + TECQ	dBm	
Stressed Receiver Sensitivity (OMAouter), each Lane	SRS			-4.3	dBm	3
Conditions of stressed receiver sensitivity test						
Stressed eye closure for PAM4		3.9			dB	

(SECQ), lane under test				
OMAouter of each aggressor lane		-0.4	dBm	

Notes:

1: Average launch power, each lane (min) is informative and not the principal indicator of signal strength

2: Transmitter reflectance is defined looking into the transmitter

3.Measured with conformance test signal at TP3 for the BER = 2.4x10-4

Electrical Characteristics(High Speed Signal)

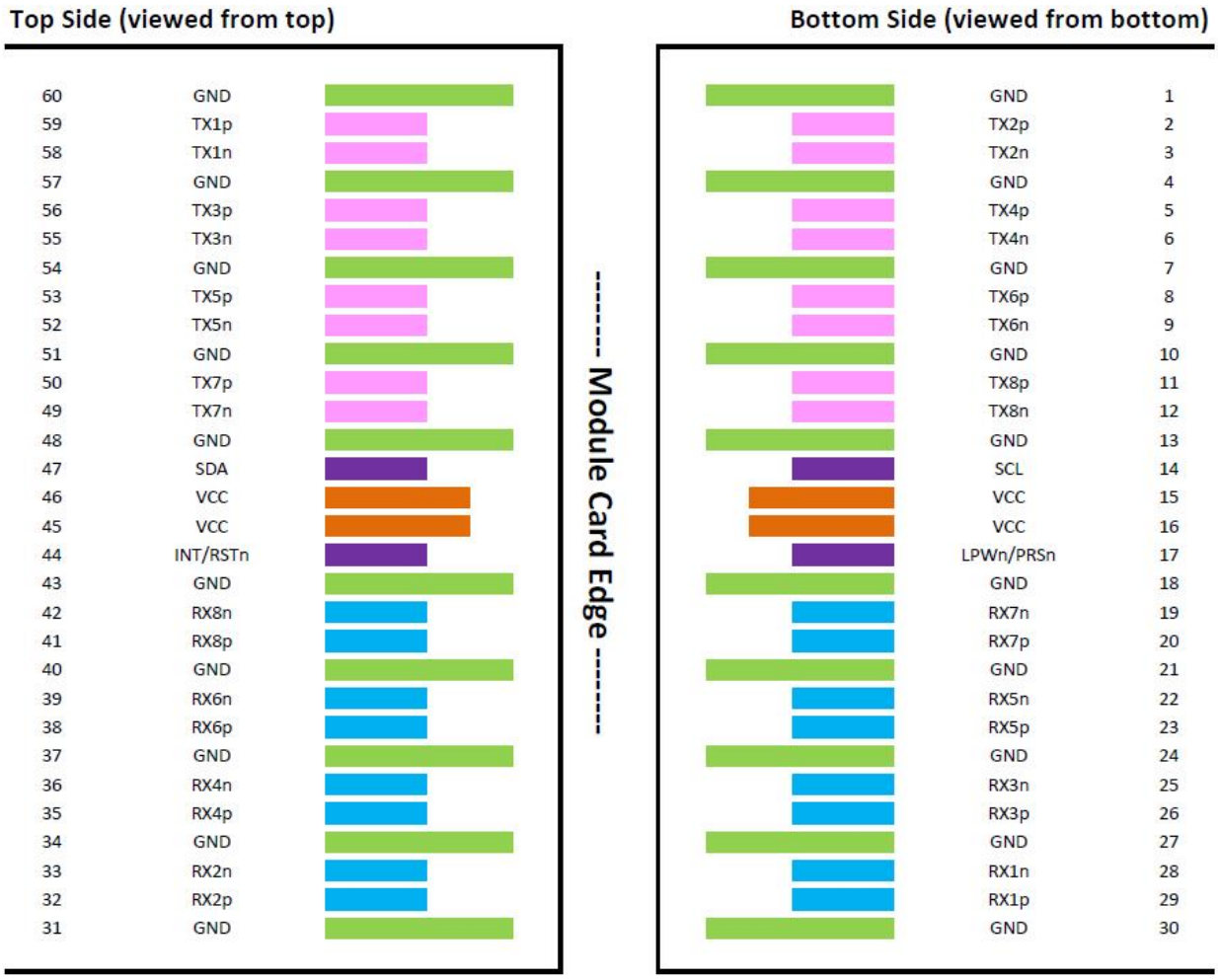
Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter (per Lane)						
Differential pk-pk input Voltage tolerance(TP1a)		750			mV	
AC common-mode RMS voltage tolerance(TP1a)		25			mV	
Differential to common-mode return loss	RLcd	802.3ck 120G-2			dB	
Effective return loss, ERL	ERL	8.5			dB	
Differential termination mismatch				10	%	
Single-ended voltage tolerance range		-0.4		3.3	V	
DC common-mode voltage tolerance		-0.35		2.85	V	
Receiver (per Lane)						
AC common-mode output Voltage (RMS)				25	mV	
Differential peak-to-peak output voltage Shortmode Longmode				 600 845	 mV mV	
Eye height, differential	EH	15			mV	

Vertical eye closure	VEC			12	dB	
Common-mode to differential return loss	RLDc	802.3ck 120G-1			dB	
Effective return loss, ERL	ERL	8.5			dB	
Differential termination mismatch				10	%	
Transition time (20% to 80%)		8.5			ps	
DC common-mode voltage		-0.35		2.85	V	

Electrical Characteristics(Low Speed Signal)

Parameter	Symbol	Min.	Max.	Unit
Module Output SCL and SDA	VOL	0	0.4	V
Module Input SCL and SDA	VIL	-0.3	VCC*0.3	V
	VIH	VCC*0.7	VCC+0.5	V
InitMode, ResetL and ModSelL	VIL	-0.3	0.8	V
	VIH	2	VCC+0.3	V
IntL	VOL	0	0.4	V
	VOH	VCC-0.5	VCC+0.3	V

Pin Descriptions



OSFP connector pin list

Pin	Name	Logic	Description	Notes
1	GND		Ground	
2	TX2p	CML-I	Transmitter Data Non-Inverted	
3	TX2n	CML-I	Transmitter Data Inverted	
4	GND		Ground	
5	TX4p	CML-I	Transmitter Data Non-Inverted	
6	TX4n	CML-I	Transmitter Data Inverted	
7	GND		Ground	
8	TX6p	CML-I	Transmitter Data Non-Inverted	
9	TX6n	CML-I	Transmitter Data Inverted	
10	GND		Ground	

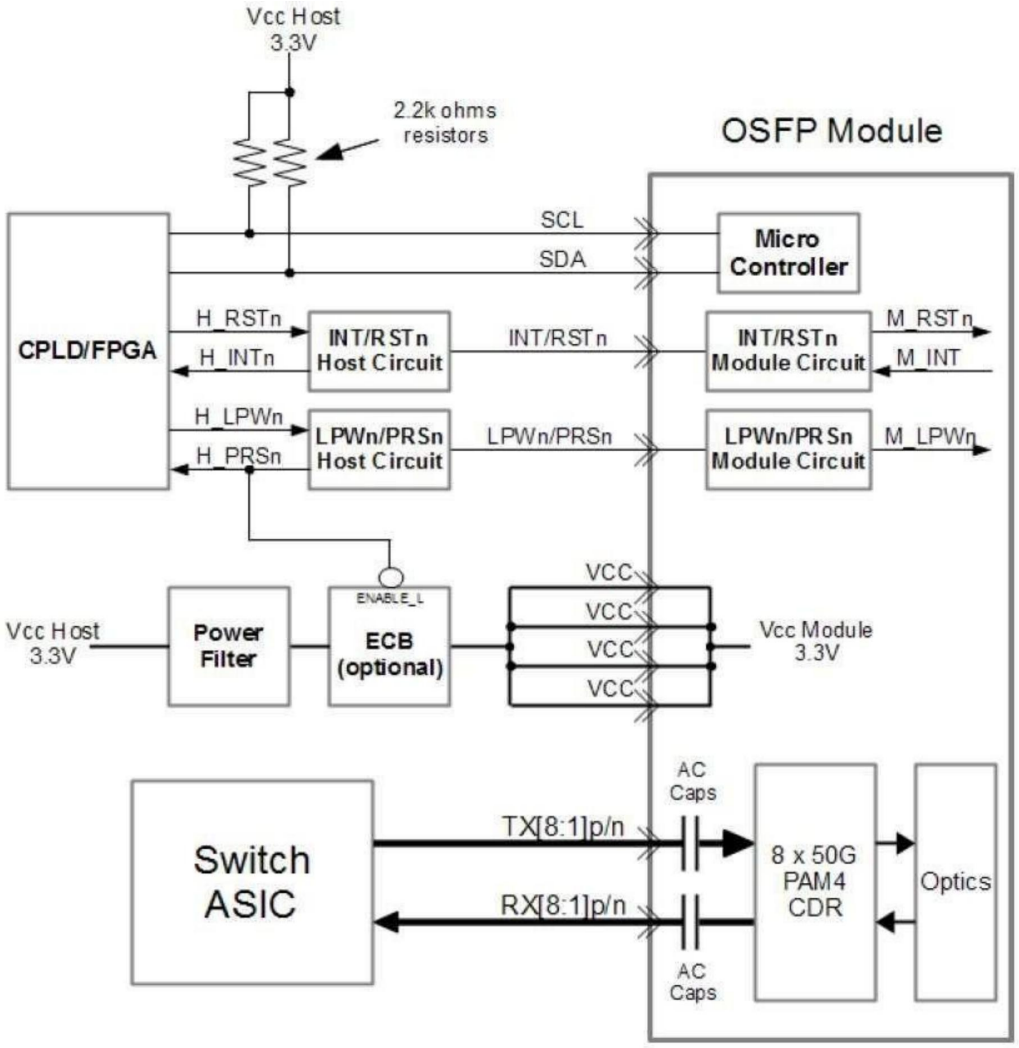
11	TX8p	CML-I	Transmitter Data Non-Inverted	
12	TX8n	CML-I	Transmitter Data Inverted	
13	GND		Ground	
14	SCL	LVCMOS-I/O	2-wire Serial interface clock	
15	VCC		+3.3V Power	
16	VCC		+3.3V Power	
17	LPWn/PRSn	Multi-Level	Low-Power Mode / Module Present	
18	GND		Ground	
19	RX7n	CML-O	Receiver Data Inverted	
20	RX7p	CML-O	Receiver Data Non-Inverted	
21	GND		Ground	
22	RX5n	CML-O	Receiver Data Inverted	
23	RX5p	CML-O	Receiver Data Non-Inverted	
24	GND		Ground	
25	RX3n	CML-O	Receiver Data Inverted	
26	RX3p	CML-O	Receiver Data Non-Inverted	
27	GND		Ground	
28	RX1n	CML-O	Receiver Data Inverted	
29	RX1p		Receiver Data Non-Inverted	
30	GND		Ground	
31	GND		Ground	
32	RX2p	CML-O	Receiver Data Non-Inverted	
33	RX2n	CML-O	Receiver Data Inverted	
34	GND		Ground	
35	RX4p	CML-O	Receiver Data Non-Inverted	
36	RX4n	CML-O	Receiver Data Inverted	
37	GND		Ground	
38	RX6p	CML-O	Receiver Data Non-Inverted	
39	RX6n	CML-O	Receiver Data Inverted	
40	GND		Ground	
41	RX8p	CML-O	Receiver Data Non-Inverted	
42	RX8n	CML-O	Receiver Data Inverted	
43	GND		Ground	
44	INT/RSTn	Multi-Level	Module Interrupt / Module Reset	
45	VCC		+3.3V Power	
46	VCC		+3.3V Power	
47	SDA	LVCMOS-I/O	2-wire Serial interface data	
48	GND		Ground	
49	TX7n	CML-I	Transmitter Data Inverted	
50	TX7p	CML-I	Transmitter Data Non-Inverted	
51	GND		Ground	
52	TX5n	CML-I	Transmitter Data Inverted	
53	TX5p	CML-I	Transmitter Data Non-Inverted	

54	GND		Ground	
55	TX3n	CML-I	Transmitter Data Inverted	
56	TX3p	CML-I	Transmitter Data Non-Inverted	
57	GND		Ground	
58	TX1n	CML-I	Transmitter Data Inverted	
59	TX1p	CML-I	Transmitter Data Non-Inverted	
60	GND		Ground	

Digital Diagnostics

Parameter	Range	Accuracy	Unit	Calibration
Temperature	0 to 70	±3	ºC	Internal
Voltage	0 to VCC	0.1	V	Internal
Tx Bias Current (Each Lane)	0 to 100	10%	mA	Internal
Tx Output Power (Each Lane)	-2.8 to +5.3	±3	dB	Internal
Rx Receive Power (Each Lane)	-9.1 to +5.3	±3	dB	Internal

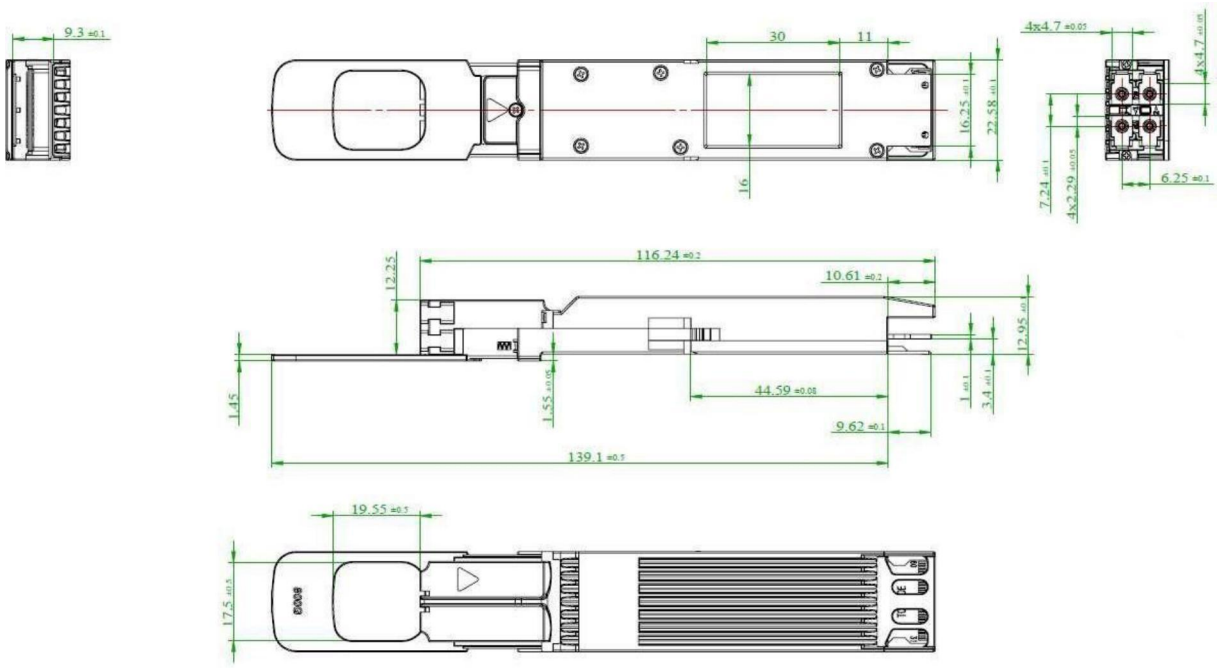
Recommended OSFP Host Board Schematic



Recommended OSFP Host Board Schematic

Mechanical Specifications

Unit: mm



Mechanical Dimensions

Ordering information

Part Number	Product Description
LO-CW800-2LR4C	OSFP, 4 CWDM Lanes, 800G, 2LR4, dual dupelx LC, SMF 10km, 0° C~+70° C